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Revision 2

Hanford Facility Dangerous Waste Closure/Postclosure Plan for the 1706-KE Waste Treatment System

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management



U.S. DEPARTMENT OF
ENERGY

Richland Operations
Office

P.O. Box 550
Richland, Washington 99352

NUCLEAR WASTE PROGRAM
RESOURCE CENTER

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Date Published
September 2009

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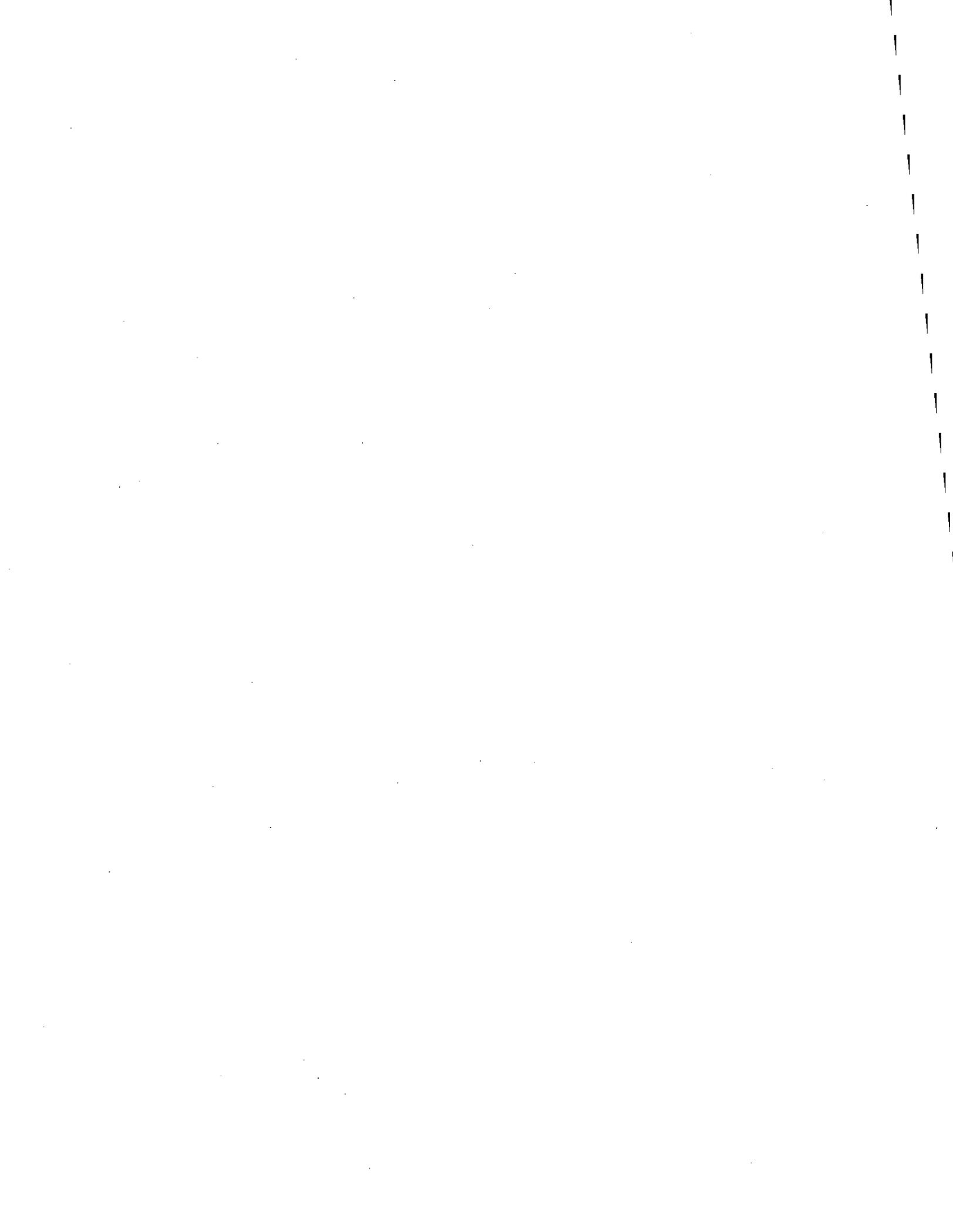
U.S. DEPARTMENT OF
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P.O. Box 550
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J. D. Asadul 09/07/2009
Release Approval Date

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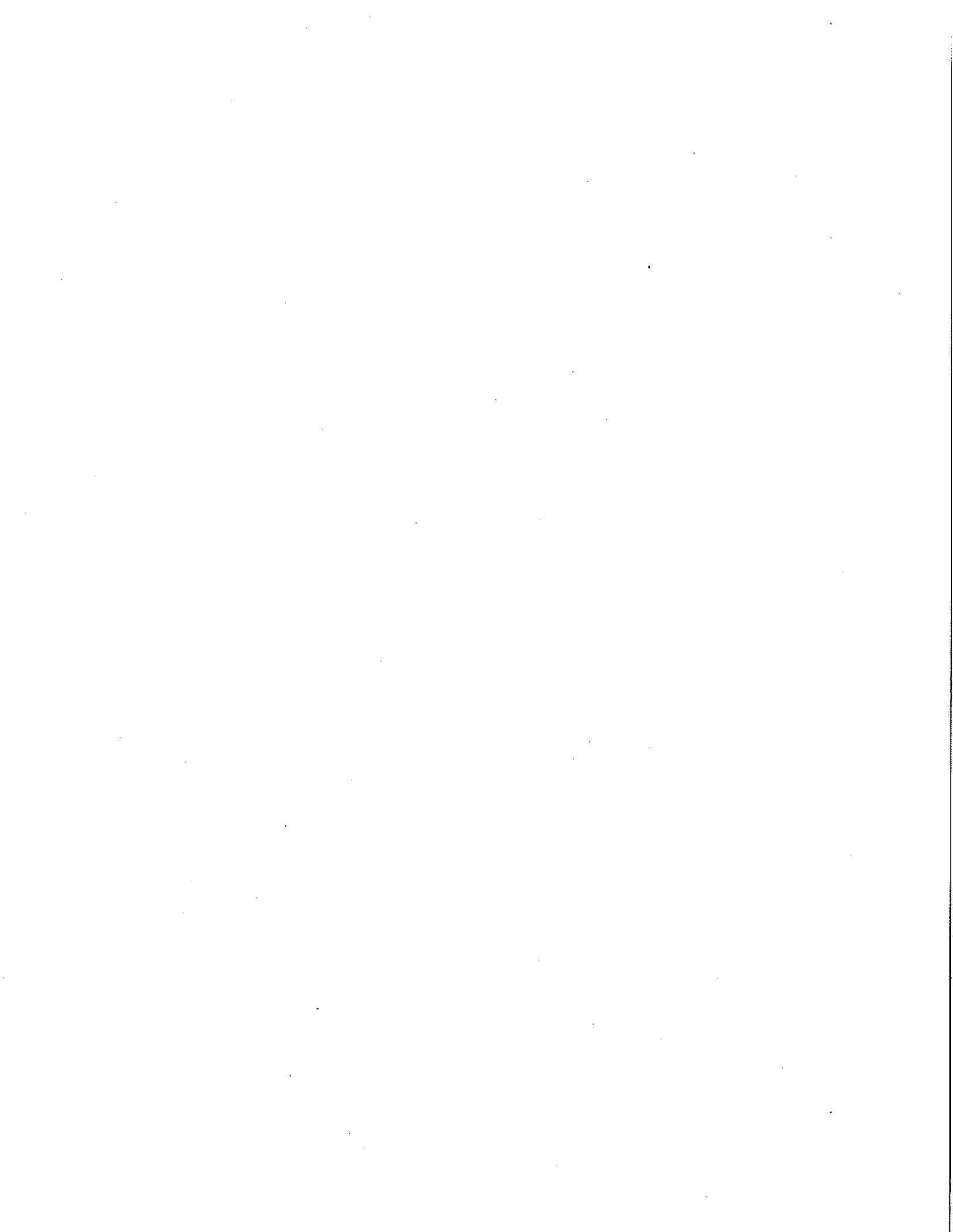


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Executive Summary

This closure plan addresses the closure of a waste treatment system located in the 100-K Area of the Hanford Site. The 1706-KE Waste Treatment System was regulated as a *Resource Conservation and Recovery Act of 1976*¹ treatment, storage, and/or disposal unit. The system had four major components (an ion exchange column, a waste accumulation tank, an evaporator unit, and a condensate collection tank) that treated a variety of laboratory wastes. The system has been clean closed pursuant to WAC 173-303-610, "Closure and Post-Closure."² The closure plan describes the requirements and activities implemented for closure by removal of the components and ancillary equipment. All waste was removed from the components prior to removal and disposal of the 1706-KE Waste Treatment System. The components and ancillary equipment have been removed and disposed in accordance with solid and dangerous waste regulations and Environmental Restoration Disposal Facility waste acceptance criteria. Because clean closure is anticipated, no postclosure care or monitoring requirements are included in this closure plan.

¹ *Resource Conservation and Recovery Act of 1976*, 42 USC 6901, et seq.

² WAC 173-303-610, "Dangerous Waste Regulations," "Closure and Post-Closure," *Washington Administrative Code*, Olympia, Washington.

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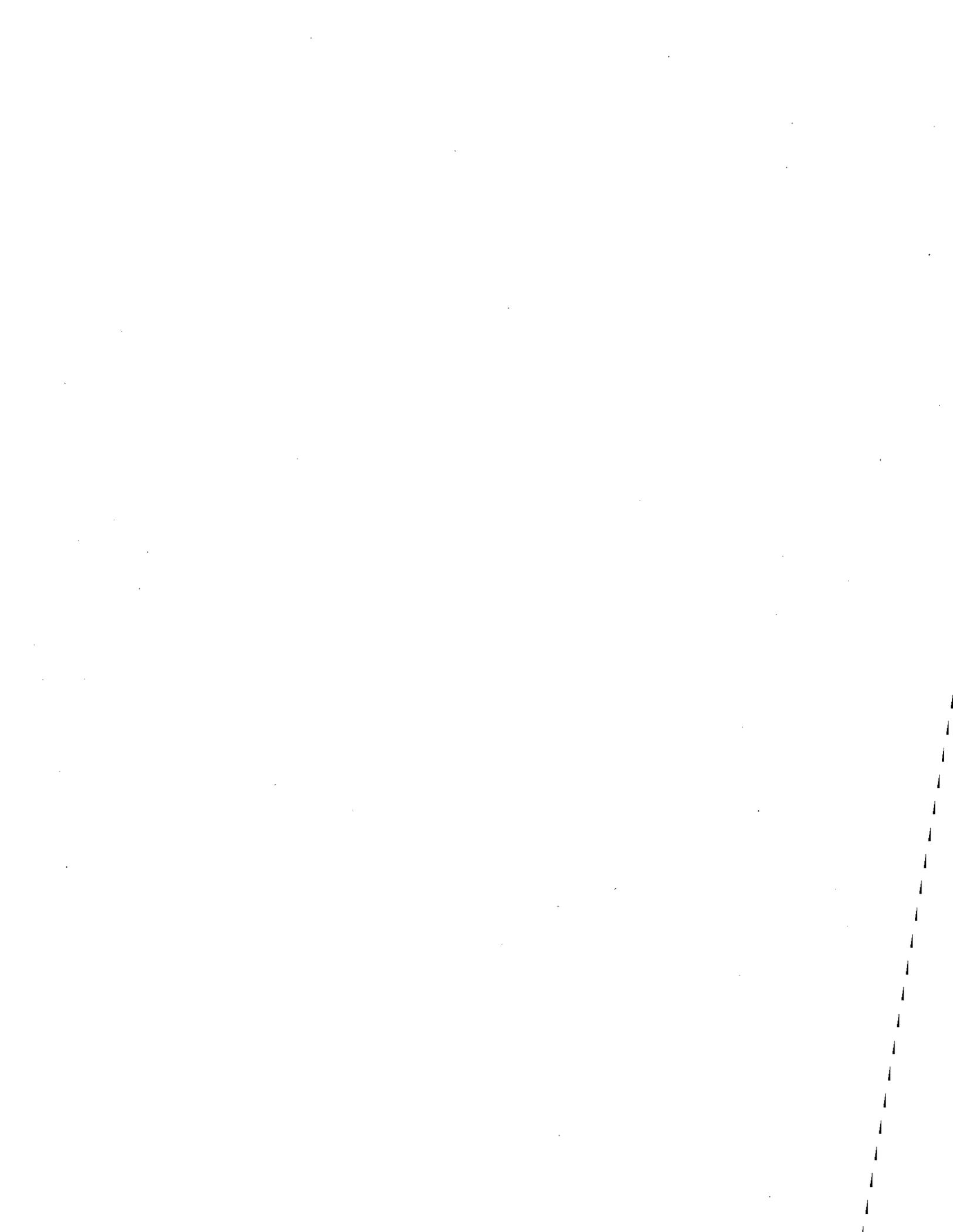
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Terms

CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
CFR	<i>Code of Federal Regulations</i>
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
Tri-Party Agreement	Ecology et al., 1989, <i>Hanford Federal Facility Agreement and Consent Order</i>
WAC	<i>Washington Administrative Code</i>
WTS	waste treatment system



1 Introduction

This closure plan describes the completed activities and performance standards for closure of the 1706-KE Waste Treatment System (WTS), a waste management unit that managed dangerous waste. The 1706-KE WTS is a *Resource Conservation and Recovery Act of 1976* (RCRA) treatment, storage, and/or disposal unit. The U.S. Department of Energy (DOE), Richland Operations Office, U.S. Environmental Protection Agency (EPA), and Washington State Department of Ecology (Ecology) have agreed to integrate the cleanup and closure of the 1706-KE WTS with the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) process. The agreement called for the 1706-KE WTS to be remediated based on the requirements of EPA/541/R-99/039, *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6 and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington (100 Area Remaining Sites)*, as provided by EPA, 2004, *Explanation of Significant Differences for the 100 Area Remaining Sites Interim Remedial Action Record of Decision*. Field implementation of the closure followed applicable sections of DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* and DOE/RL-96-22, *100 Area Remedial Action Sampling and Analysis Plan*, as well as other documented agreements, such as the Tri-Party Agreement (Ecology et al., 1989, *Hanford Federal Facility Agreement and Consent Order*) change notices made during the closure action.

The 1706-KE WTS was located within the 1706-KE Building in the 100-K Area of the Hanford Site (Figure 1) and had four major components (an ion exchange column, a waste accumulation tank, an evaporator unit, and a condensate collection tank) depicted in Figures 2 through 5. The 1706-KE WTS has been nonoperational since 1987. All waste has been removed from the 1706-KE WTS components and the components and ancillary equipment have been removed and disposed.

The 1706-KE WTS underwent clean closure to the performance standards of WAC 173-303-610(2)(b)(ii), "Closure Performance Standard," with respect to all dangerous waste contamination from dangerous waste/RCRA operations. To accomplish clean closure, the unit and ancillary equipment were removed and disposed to the Environmental Restoration Disposal Facility (ERDF). Because waste or waste constituents were left in place at the completion of closure, no postclosure care or monitoring is anticipated.

The closure activities under this plan supported completion of Milestone M-16-52 by July 31, 2009.

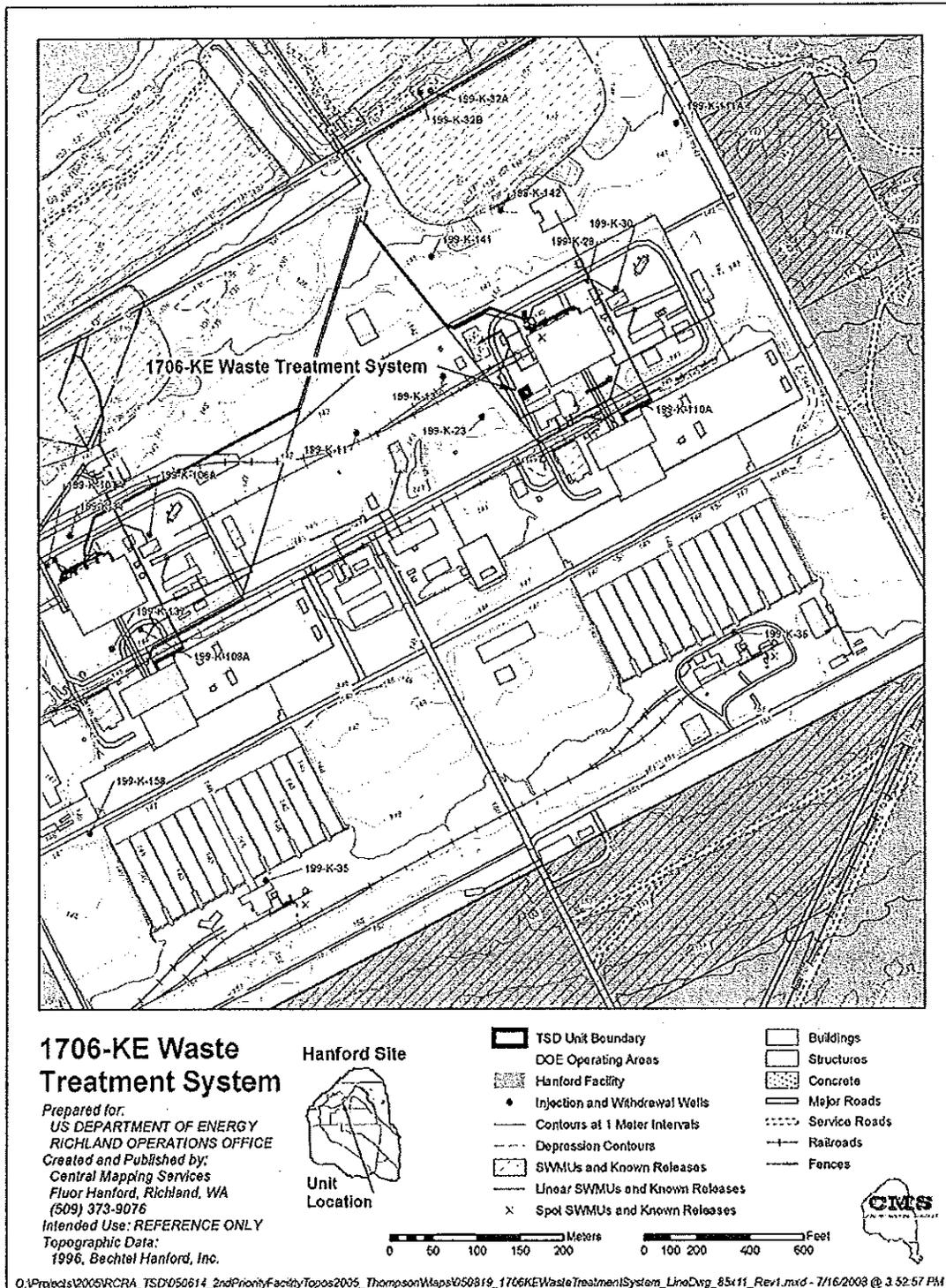
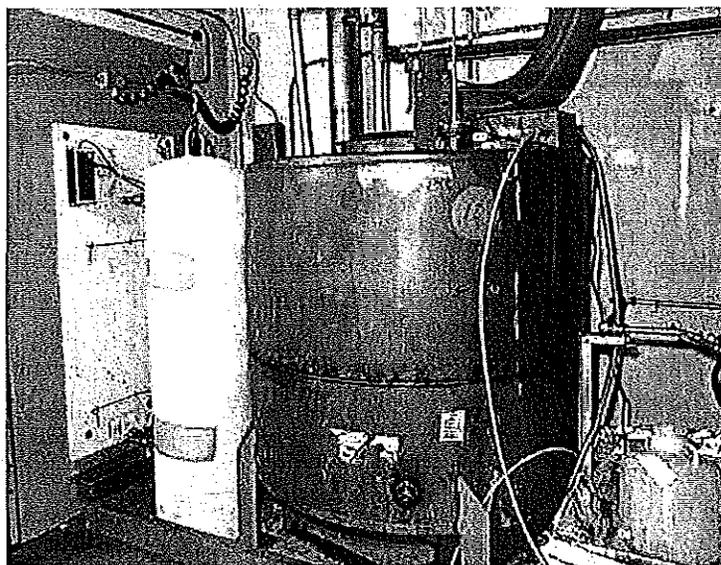


Figure 1. 1706-KE WTS Facility Location



Ion Exchange Column & Waste Accumulation Tank

8700734-1CN

Photo Taken 1987

NOTE: Ion exchange column (left) has been removed since this photograph was taken.

Figure 2. Ion Exchange Column and Waste Accumulation Tank

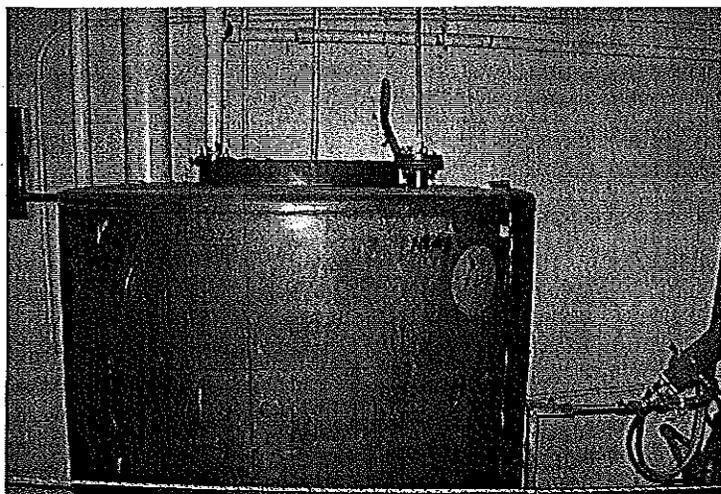
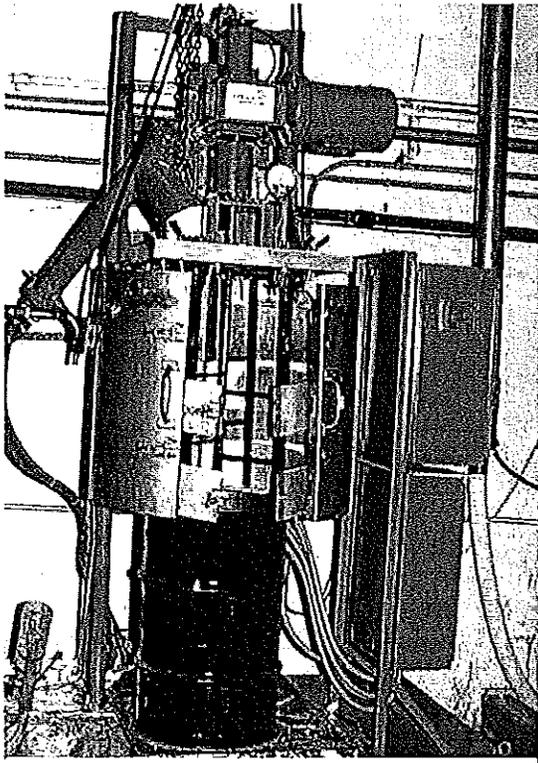
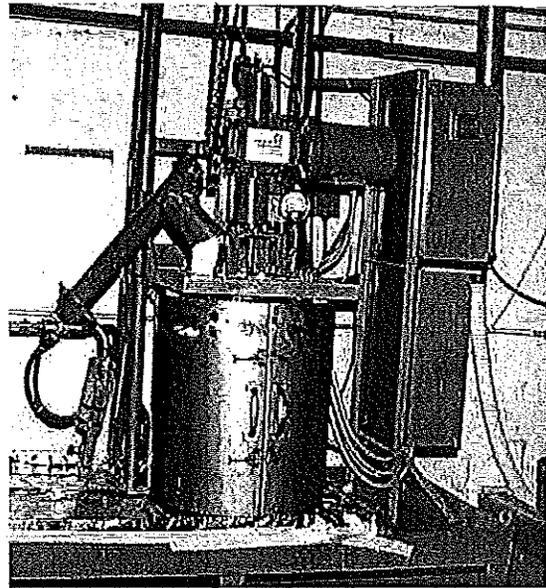


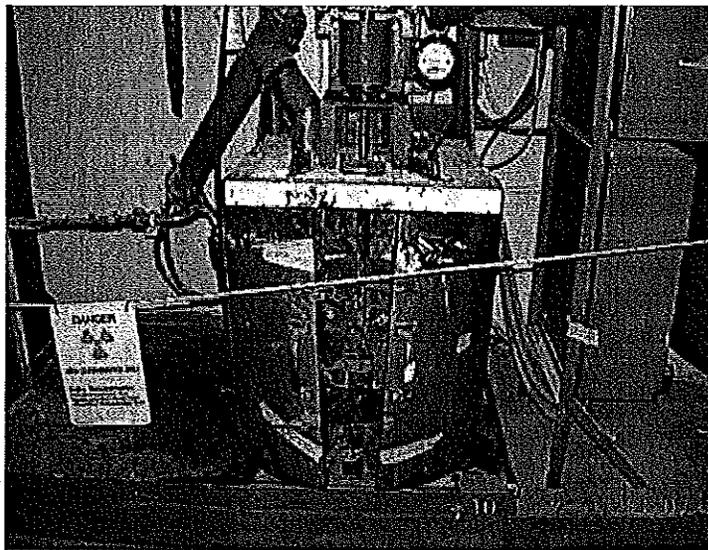
Figure 3. Waste Accumulation Tank



Evaporator Unit in Up Position



Evaporator Unit in Down Position Evaporating Waste



Evaporator Unit

Figure 4. Evaporation Unit Showing Spill/Overflow

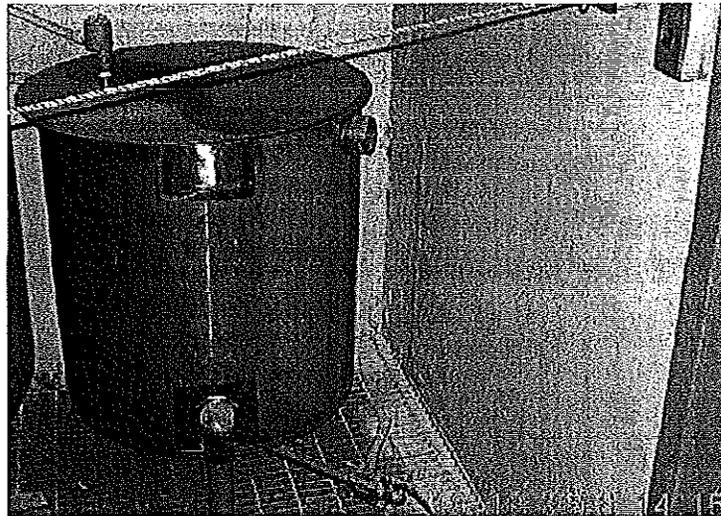
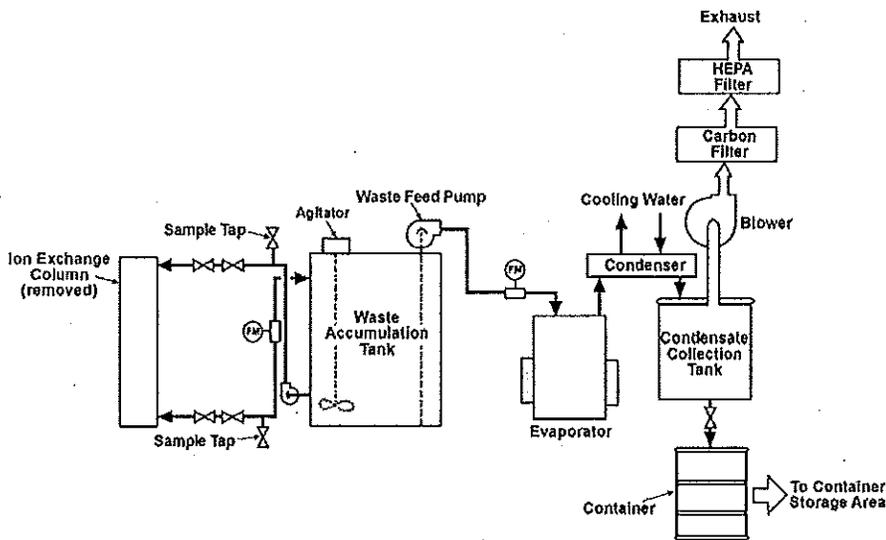


Figure 5. Condensate Collection Tank

2 Facility Description

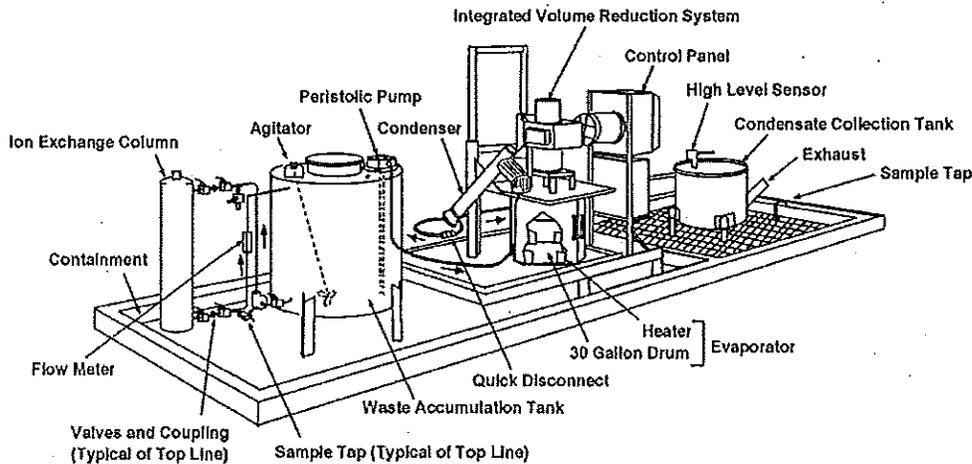
The 1706-KE WTS consisted of a 114 L (30-gal) evaporator unit, a 2,082 L (550-gal) waste accumulation tank, a 0.14 m³ (5-ft³) mixed-bed resin ion exchange column, and a 363 L (96-gal) condensate collection tank (Figure 6 below).

The maximum process design capacities for tank storage (S02) are 2,445 L (646 gal) and for tank treatment-other (T04) is 5,678 L (1,500 gal).



FM = Flow Meter
 HEPA = High-Efficiency Particulate Air

M0703-1.1
 3-11-07



M0703-1.2
 3-26-07

Figure 6. 1706-KE WTS Schematics

3 Process Information

The 1706-KE WTS was designed and installed for waste management operations in July 1986. The unit was procured to treat mixed waste generated in the laboratories of the 1706-KE Building. The 1706-KE WTS was designed to treat approximately 6,804 kg (15,000 lb) of waste per year.

Waste generated in the 1706-KE Building was transferred from the waste accumulation tank to the ion exchange column and then continuously recirculated to remove the ionic constituents from the waste stream. The waste then was transferred to the evaporator. The evaporator heated and boiled the liquid

waste to steam to form residual salts prior to solidification. The steam condensed and collected in the condensate collection tank with the exhaust from the evaporation unit being passed through a high-efficiency particulate air filter prior to discharge. The residual salts were mixed with heated epoxy for solidification and disposal.

Operation of this unit ceased shortly after initial startup because of unanticipated anomalies during operation. In August of 1986, epoxy resin in the evaporator overheated, possibly caused by a development of a steam pocket within the epoxy. Thick white vapor was observed from the 1706-KE WTS and some epoxy was ejected through the observation port onto the ceiling and adjoining wall. The system was immediately shut down. The epoxy cooled and solidified, as shown in Figure 7. The room and the equipment were decontaminated for continued use. The waste associated with the release was removed and appropriately managed. No waste was released outside the radiologically posted area or into the environment (D/T 86-01, 1986, *Epoxy Overheat in 1706-KER 100K*). The 1706-KE WTS has not operated since 1987.

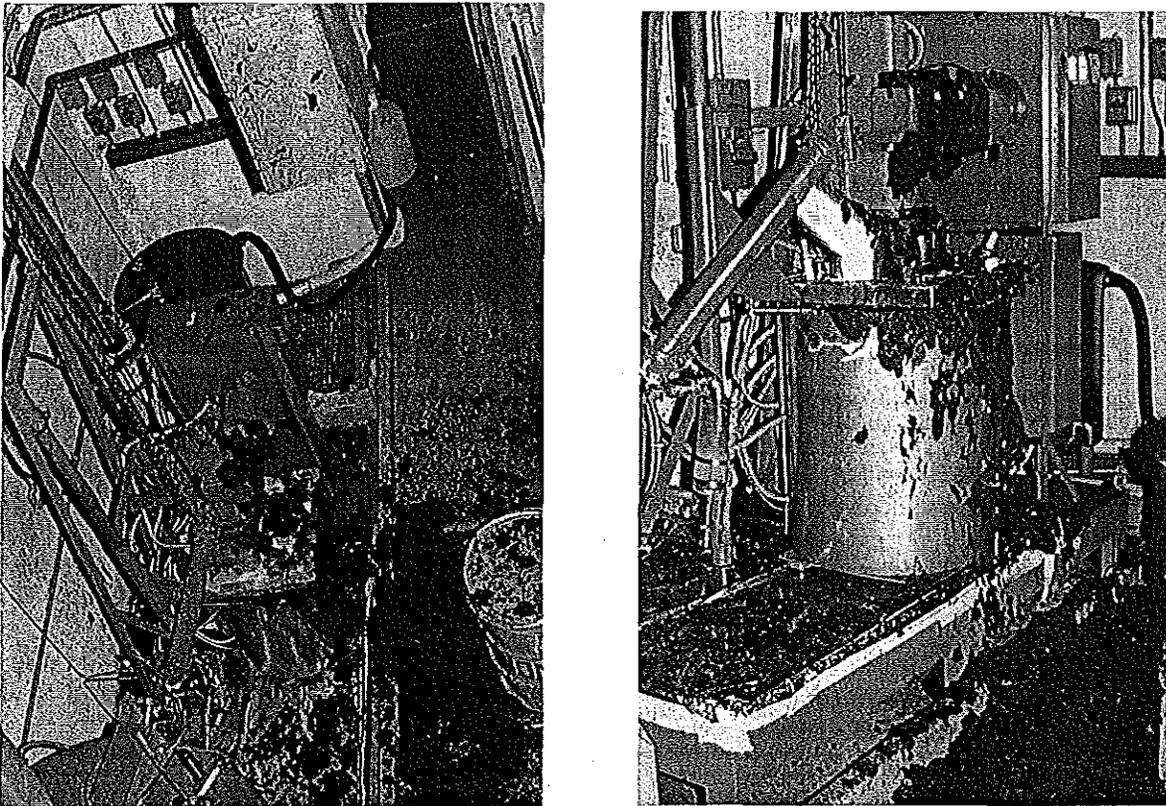


Figure 7. 1986 Epoxy Incident in Evaporator Unit

In July 1987, the accumulation tank was disconnected from the other components, emptied, and cleaned so that it could be used as the feed tank for the Liquid Effluent Treatment Facility studies. To ensure the feed stock would not be contaminated, the tank was physically cleaned and decontaminated with scrub brushes and detergents. It then was filled with demineralized water, to which trace amounts of cesium and iodine were added to simulate 100-N Reactor water. The water was processed through candidate ion exchange resins to evaluate the resins for use in the Liquid Effluent Treatment Facility. The effluent water from these tests was stored in drums, analyzed, and released. At least 10 tanks full were processed between July 1987 and February 1988 when testing ceased.

From early 1988 to March of 1990, the waste accumulation tank was used to collect effluents and loop bleeds from the TF-9 high-pressure test loop, which performed long-term corrosion tests in support of the 100-N Reactor tritium fuel cladding program. The effluent in the accumulation tank consisted of demineralized water with ammonium hydroxide added to a pH of 10.3. In addition, a small quantity of low oxidation metal ions solution, ammonium citrate, and 100-N Reactor water were added as part of the laboratory cleanup. The effluent in the accumulation tank was analyzed and treated, as needed. Then tank effluent recirculated through an ion exchange column and was analyzed for radionuclide content.

No waste remained in the 1706-KE WTS condensate collection tank (Figure 8), the evaporator, or waste accumulation tank. Waste removed from the 1706-KE WTS has been disposed to the Low-Level Burial Grounds (WHC, 1990, "1706-KE Waste Treatment System Tank;" WHC, 1996, "Low-Level Burial Grounds Solid Waste Storage/Disposal Records, 1706-94-001700 and 1706-96-000016).



Figure 8. Current 1706-KE WTS Photographs of the Evaporator and the Condensate Collection Tank

The 1706-KE WTS components and ancillary equipment used in operations were removed using standard industrial equipment for structural demolition.

To accomplish removal of the condensate collection tank, evaporator unit, and waste accumulation tank, a hatchway located immediately above the 1706-KE WTS area was used, which allowed direct removal of the components to the outside of the building and for loading into ERDF shipping containers for disposal at the ERDF. Because of the size of the waste accumulation tank in relation to the hatchway, size reduction was performed cutting the component into two halves. The tank halves were then loaded into shipment K100-09-1346. The condensate collection tank and evaporator unit were lifted intact through the hatchway, and loaded into a shipping container in preparation for disposal at the ERDF. Following removal of the tanks, the room in which the tanks were located was cleaned of debris and surveyed for radiological contamination. Incidental debris, including piping and other materials present during the July 7, 2009 walkthrough, was removed and disposed by packaging in ERDF containers and transported to the ERDF. All remaining incidental radiological contamination was fixed in place. No evidence of the WTS-related debris was found. Figure 9 below provides photographs of the 1706-KE WTS area, with all components and debris removed as evidence of achieved of clean closure.

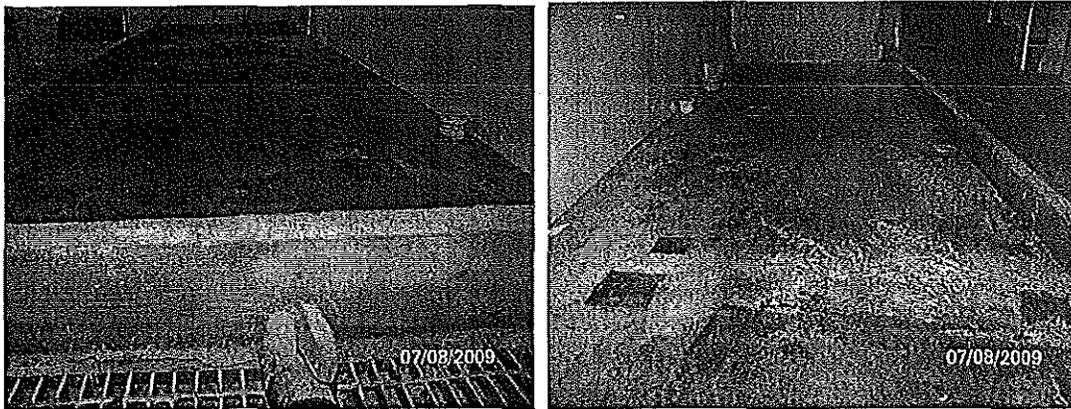


Figure 9. 1706-KE WTS Area After Clean Closure

Removal and packaging of the tanks was accomplished during the period from June 15 through July 1, 2009. The tanks were shipped to the ERDF on July 9, 2009. As of July 9, 2009, all components of the 1706-KE WTS were removed from the 1706-KE Facility and shipped for disposal at the ERDF. The Onsite Waste Tracking Forms K100-09-1346 and K-100-09-1347 document the shipment and disposal of the tanks which were loaded on July 1, 2009. The shipments were transported to ERDF on July 9, 2009. The appendix provides the shipping documentation.

4 Waste Characteristics

The 1706-KE WTS was designed and installed to treat a variety of laboratory waste. The majority of this waste was expected to be acidic or caustic solutions (D002, characteristic, corrosive, dangerous waste).

5 Closure Strategy and Performance Standards

This section discusses achievement of the closure strategy and performance standards.

5.1 Closure Strategy

Clean closure of the 1706-KE WTS has been achieved and no further actions are required.

5.2 Performance Standards

Clean closure of the 1706-KE WTS has been accomplished using the closure standard in WAC 173-303-610(2)(b)(ii), which states the following:

For all structures, equipment, bases, liners, etc., clean closure standards will be set by the department on a case-by-case basis in accordance with the closure performance standards of WAC 173-303-610(2)(a)(ii) and in a manner that minimizes or eliminates post-closure escape of dangerous waste constituents.

WAC 173-303-610(2)(a)(ii) further states that a facility must be closed in a manner that meets the following:

Controls, minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate,

contaminated run-off, or dangerous waste decomposition products to the ground, surface water, ground water, or the atmosphere.

The clean closure performance standard involved the physical removal and disposal of the 1706-KE WTS components, including ancillary equipment. To clean close, all components have been removed and managed as waste.

For contaminated structural components of the 1706-KE WTS (e.g., unit components, ancillary equipment), the closure performance standard will be a "clean debris surface" to establish that a component has been decontaminated, or whether the unit or ancillary equipment can be designated as non-hazardous debris. Attainment of a clean debris surface can be verified visually, in accordance with the standard in WAC 173-303-140(2)(a), "Applicability," incorporating 40 CFR 268.45, "Treatment Standards For hazardous debris," Table 1, footnote 3, which states the following.

Clean debris surface" means that the surface, when viewed without magnification, will be free of all visible contaminated soil and hazardous (dangerous) waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits will be limited to no more than 5 % of each square inch of surface area.

6 Closure Certification

Closure activities were performed consistent with DOE/RL-96-17 and Ecology Publication 92-91, *Dangerous Waste Regulations Chapter 173-303 WAC*.

Certification of closure will be submitted in accordance with WAC 173-303-610(6), "Certification of Closure." Clean closure has been completed.

At the time of closure certification, the RCRA corrective action status of the 1706-KE WTS will be determined, in accordance with Permit Condition II.Y.2.c.

7 Postclosure Plan

No postclosure activity is required following successful completion of clean closure of the 1706-KE Waste Treatment Unit.

8 References

40 CFR 268.45, "Land Disposal Restrictions," "Treatment Standards for Hazardous Debris," *Code of Federal Regulations*. Available at:
http://www.access.gpo.gov/nara/cfr/waisidx_08/40cfr268_08.html.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601, et seq. Available at: <http://www.epa.gov/oecaagct/lcla.html#Hazardous%20Substance%20Responses>.

DOE/RL-96-17, *Remedial Design Report Remedial Action Work Plan for the 100 Area*, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at:
<http://www2.hanford.gov/arpir/?content=findpage&AKey=D6542354>.

- DOE/RL-96-22, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: <http://www5.hanford.gov/arpir/?content=detail&AKey=D6542136>.
- D/T 86-01, 1986, *Epoxy Overheat in 1706-KER 100K*, UNC Nuclear Industries, Richland, Washington. Available at: <http://www5.hanford.gov/arpir/?content=detail&AKey=0903311061>.
- Ecology Publication 92-91, 2000, *Dangerous Waste Regulations Chapter 173-303 WAC*, Washington State Department of Ecology, Olympia, Washington. Available at: <http://www.ecy.wa.gov/biblio/9291.html>.
- Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington. Available at: <http://www.hanford.gov/?page=91&parent=0>.
- EPA, 2004, *Explanation of Significant Differences for the 100 Area Remaining Sites Interim Remedial Action Record of Decision*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington. Available at: <http://www5.hanford.gov/arpir/?content=findpage&AKey=D4855290>.
- EPA/541/R-99/039, 1999, *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6 and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington (100 Area Remaining Sites)*, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. Available at: <http://www.epa.gov/superfund/sites/rods/>.
- Resource Conservation and Recovery Act of 1976*, 42 USC 6901, et seq. Available at: <http://www.epa.gov/epawaste/inforesources/online/index.htm>.
- WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, Olympia, Washington. Available at: <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303>.
- WAC 173-303-140, "Land Disposal Restrictions."
 - WAC 173-303-140(2)(a), "Applicability."
 - WAC 173-303-610(2), "Closure Performance Standard."
 - WAC 173-303-610(6), "Certification of Closure."
- WHC, 1990, "1706-KE Waste Treatment System Tank" (Internal Memo to L. A. Garner from B. B. Emory), Westinghouse Hanford Company, Richland, Washington, March 30. Available at: <http://www2.hanford.gov/arpir/?content=findpage&AKey=0903311058>.
- WHC, 1996, *Low-Level Burial Grounds Solid Waste Storage/Disposal Records, 1706-94-001700 and 1706-96-000016*, Westinghouse Hanford Company, Richland, WA. Available at: <http://www2.hanford.gov/arpir/?content=findpage&AKey=0903311062>.

Appendix

Shipping Records

Shipping Records

The ERDF accepted the 1706-KE Waste Treatment System tanks transported on July 9, 2009. Onsite Waste Tracking Forms K100-09-1346 and K-100-09-1347 document the shipment and disposal of the tanks.

Onsite Waste Tracking Form K100-09-1346		Page 1 of 1	
Disposal location information			
1. Disposal Coordinates	N:	W:	2. Lift
3. Disposal: Initials _____ Date _____			
3a. <input checked="" type="checkbox"/> Disposal <input type="checkbox"/> Stockpile <input type="checkbox"/> Treatment - Batch #		3b. <input type="checkbox"/> Placed Pending Action* <input type="checkbox"/> MACRO <input type="checkbox"/> GROUT FILL	
		Action/Disposal Completed Initials _____ Date _____	
4. Transport approval number K100-09-1346		5. Date Shipped	
6. Generator's US EPA ID NO: WA789008967		7. Generator's name & mailing address: U.S. Department of Energy Richland Operations, P.O. Box 550 Richland, WA 99352	
8. Transporter company name: WCH			
9. Point of Origin: 100KE / OHC		10. Waste vol. (m ³) 11.3398	
11. TI N/A			
12. Billing Code XR0919		13. Date Filled 7-1-09	
14. Label N/A			
15. Net wt. (kg) 18143.7		16. Gross wt. (kg) 18143.7	
17. Exclusive Use Shipment <input checked="" type="checkbox"/> Y <input type="checkbox"/> N			
18. Container# 2935		19. Container BULK METAL BOX	
20. # of Containers 1			
21. US DOT description (PSN, HC, ID number, PG) RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY, LSA (II), FISSILE EXCEPTED, 7, UN3321, SOLID, ELEMENTAL, EXCLUSIVE USE SHIPMENT			
SPA Checklist #: N/A DE-CI: 2.32E-05 NRC CLASS: A			
22. Waste Profile No.: WP1706KE001 Rev# 0		23. Template: 1706KE DEMO	
This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.			
24. Signature HASSON, JOHN W <i>[Signature]</i>		25. LDR Treatment Required <input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
26. Applicable waste codes NONE			
27. Emergency Contact: 509-373-3800		28. Total TBqs 1.60E-02	
29. Sum of Fractions: Initial: 3.46E-04 Combustible: 2.24E-04 Soil, Powder, Metals: 1.17E-04 Grout, Concrete: 1.03E-04			
30. Description STANDARD BULK WASTE WSRP: OHC-RP-W0012 001 <i>split tank</i>			
31. Soil/Debris Estimate: <input type="checkbox"/> SOIL <input type="checkbox"/> 50/50 <input checked="" type="checkbox"/> Debris <input type="checkbox"/> All Metal			
32. Soil/Debris Actual (optional): <input type="checkbox"/> SOIL <input type="checkbox"/> 50/50 <input type="checkbox"/> Debris <input type="checkbox"/> All Metal			
33. Radionuclides			
Radionuclide	Limit (Ci/m ³)	Actual (Ci/m ³)	
Am-241	5.40E-02	1.87E-07	
C-14	5.10E+00	5.71E-03	
Co-60	NL	2.51E-03	
Cs-137	3.20E+01	8.16E-07	
Fe-55	NL	1.76E-04	
H-3	NL	3.92E-04	
Nb-93m	NL	7.10E-05	
Ni-59	2.10E+02	2.91E-04	
Ni-63	7.00E+02	2.85E-02	
Pu-239	2.90E-02	2.40E-07	
Pu-241	5.60E+00	1.21E-06	
Sb-125	NL	8.80E-05	
Sn-121m	5.60E+03	3.04E-04	
Zr-93	1.40E+02	9.14E-05	

WCH-EE-286 (05/06/2009)

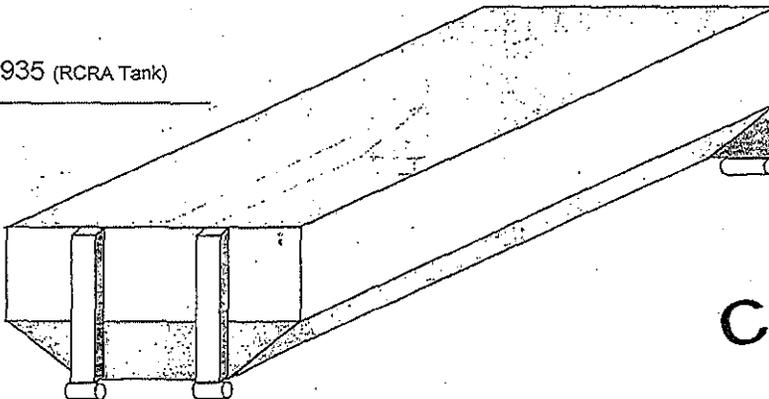
OWTF RCT FORM

Radiological Data for OWTF #: K100-02-1346

Surface Dose Rate of Package	Dose Rate @ 1 Meter from Surface of Package	Dose Rate @ 30 cm from Surface of Package	Smears of Outer Container	TRUCK LOAD OR EXCLUSIVE USE
<input checked="" type="checkbox"/> <0.005 or _____ mSv/hr <0.5 or _____ mrem/hr (N + βγ)	<input checked="" type="checkbox"/> <0.005 or _____ mSv/hr <0.5 or _____ mrem/hr (N + βγ)	<input checked="" type="checkbox"/> <1.0 or _____ mSv/hr <100 or _____ mrem/hr (N + βγ)	<input checked="" type="checkbox"/> <0.4 Bq (22 dpm) βγ / cm ² <input checked="" type="checkbox"/> <0.04 Bq (2.2 dpm) α / cm ² <input checked="" type="checkbox"/> < Tbl. 2-2 HSRCM Onsite Limits	Surface <input checked="" type="checkbox"/> <2 mSv/hr (200 mrem/hr) @ 2 meters <input checked="" type="checkbox"/> <0.1 mSv/hr (10 mrem/hr)

Additional Data and instructions (Include Readings on Internal Packaging):

ERDF Can # 2935 (RCRA Tank)



COPY

Signature - Radiation Monitoring <i>[Signature]</i>	Bldg. <u>10-872</u>	Survey No. <u>PAGE 3 of 4</u> <u>FD-K090708</u>	Date <u>7-1-09</u>
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Attach to the OWTF.

Completed by the Radiological Control Technician (RCT) including surface dose rate in Sieverts, dose rate at 1 meter, re-moveable contamination smear surveys in bacquerels, vehicle dose rates in Sieverts, along with the RCT's signature, the building, survey number and date.

NOTE: For onsite shipments requiring HNF-5173 release limits, check appropriate box to verify application of Table 2-2 limits.

A-6004-031 (11/05)

Onsite Waste Tracking Form K100-09-1347			Page 1 of 1
Disposal Location Information			
1. Disposal Coordinates N:		2. Lift	
3. Disposal: Initials _____ Date _____			
3a. <input checked="" type="checkbox"/> Disposal <input type="checkbox"/> Stockpile <input type="checkbox"/> Treatment - Batch #		3b. *Action (select one) <input type="checkbox"/> Placed Pending Action* <input type="checkbox"/> MACRO <input type="checkbox"/> GROUT FILL Action/Disposal Completed Initials _____ Date _____	
4. Transport approval number K100-09-1347		5. Date Shipped	
6. Generator's US EPA ID NO: WA789008967		7. Generator's name & mailing address: U.S. Department of Energy Richland Operations, P.O. Box 550 Richland, WA 99352	
		8. Transporter company name: WCH	
9. Point of Origin: 100KE / OHC		10. Waste vol. (m ³) 11.3398	
12. Billing Code XR0919		13. Date Filled 7-1-09	
15. Net wt. (kg) 18143.7		14. Label N/A	
16. Gross wt. (kg) 18143.7		17. Exclusive Use Shipment <input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
18. Container# 3146		19. Container BULK METAL BOX	
		20. # of Containers 1	
21. US DOT description (PSN, HC, ID number, PG) RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY, LSA (II), FISSILE EXCEPTED, 7, UN3321, SOLID, ELEMENTAL, EXCLUSIVE USE SHIPMENT			
SPA Checklist #: N/A		DE-CI: 2.32E-05 NRC CLASS: A	
22. Waste Profile No.: WP1706KE001 Rev# 0		23. Template: 1706KE DEMO	
This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.			
24. Signature HASSON, JOHN W <i>[Signature]</i>		25. LDR Treatment Required <input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
26. Applicable waste codes NONE			
27. Emergency Contact: 509-373-3800		28. Total TBq 1.60E-02	
29. Sum of Fractions: Initial: 3.46E-04 Combustible: 2.24E-04 Soil, Powder, Metals: 1.17E-04 Grout, Concrete: 1.03E-04			
30. Description STANDARD BULK WASTE			
WSRP: OHC-RP-W0012 001 <i>asbestos transite - small xams</i>			
31. Soil/Debris Estimate: <input type="checkbox"/> SOIL <input type="checkbox"/> 50/50 <input checked="" type="checkbox"/> Debris <input type="checkbox"/> All Metal			
32. Soil/Debris Actual (optional): <input type="checkbox"/> SOIL <input type="checkbox"/> 50/50 <input type="checkbox"/> Debris <input type="checkbox"/> All Metal			
33. Radionuclides			
Radionuclide	Limit (Ci/m ³)	Actual (Ci/m ³)	
Am-241	5.40E-02	1.87E-07	
C-14	5.10E+00	5.71E-03	
Co-60	NL	2.51E-03	
Cs-137	3.20E+01	8.16E-07	
Fe-55	NL	1.76E-04	
H-3	NL	3.92E-04	
Nb-93m	NL	7.10E-05	
Ni-59	2.10E+02	2.91E-04	
Ni-63	7.00E+02	2.86E-02	
Pu-239	2.90E-02	2.40E-07	
Pu-241	5.60E+00	1.21E-06	
Sb-125	NL	8.80E-05	
Sn-121m	5.60E+03	3.04E-04	
Zr-93	1.40E+02	9.14E-05	

WCH-EE-286 (05/06/2009)

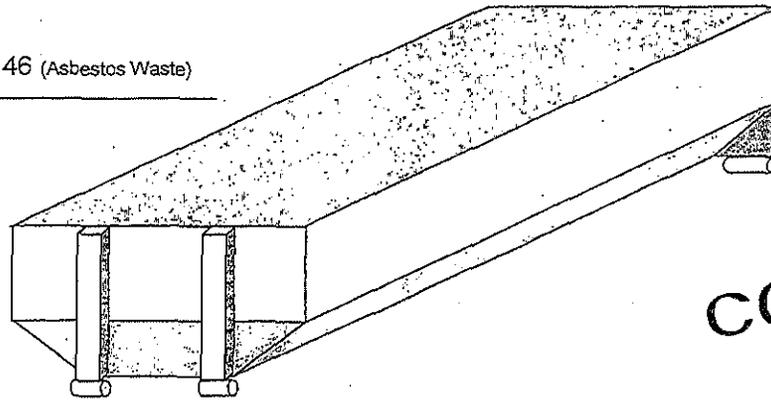
OWTF RCT FORM

Radiological Data for OWTF #: K100-09-1347

Surface Dose Rate of Package	Dose Rate @ 1 Meter from Surface of Package	Dose Rate @ 30 cm from Surface of Package	Smears of Outer Container	TRUCK LOAD OR EXCLUSIVE USE
<input checked="" type="checkbox"/> <0.005 or _____ mSv/hr <0.5 or _____ mrem/hr ($N + \beta\gamma$)	<input checked="" type="checkbox"/> <0.005 or _____ mSv/hr <0.5 or _____ mrem/hr ($N + \beta\gamma$)	<input checked="" type="checkbox"/> <1.0 or _____ mSv/hr <100 or _____ mrem/hr ($N + \beta\gamma$)	<input checked="" type="checkbox"/> <0.4 Bq (22 dpm) $\beta\gamma$ / cm ² <input checked="" type="checkbox"/> <0.04 Bq (2.2 dpm) α / cm ² <input checked="" type="checkbox"/> < Tbl. 2-2 HSRCM Onsite Limits	Surface <input checked="" type="checkbox"/> <2 mSv/hr (200 mrem/hr) @ 2 meters <input checked="" type="checkbox"/> <0.1 mSv/hr (10 mrem/hr)

Additional Data and Instructions (Include Readings on Internal Packaging):

ERDF Can # 3146 (Asbestos Waste)



COPY

Signature - Radiation Monitoring <i>[Signature]</i>	Bldg. <u>110-872</u>	Survey No. <u>1106 4+4</u> <u>ED-K090708</u>	Date <u>7-1-09</u>
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Attach to the OWTF.

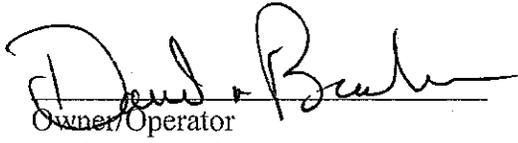
Completed by the Radiological Control Technician (RCT) including surface dose rate in Sieverts, dose rate at 1 meter, re-moveable contamination smear surveys in bacquerets, vehicle dose rates in Sieverts, along with the RCT's signature, the building, survey number and date.

NOTE: For onsite shipments requiring HNF-5173 release limits, check appropriate box to verify application of Table 2-2 limits.

A-6004-031 (11/05)

Closure Certification
For
1706-KE Waste Treatment System

We, the undersigned, hereby certify that 1706-KE Waste Treatment System closure activities were performed in accordance with the specifications in the approved closure plan.



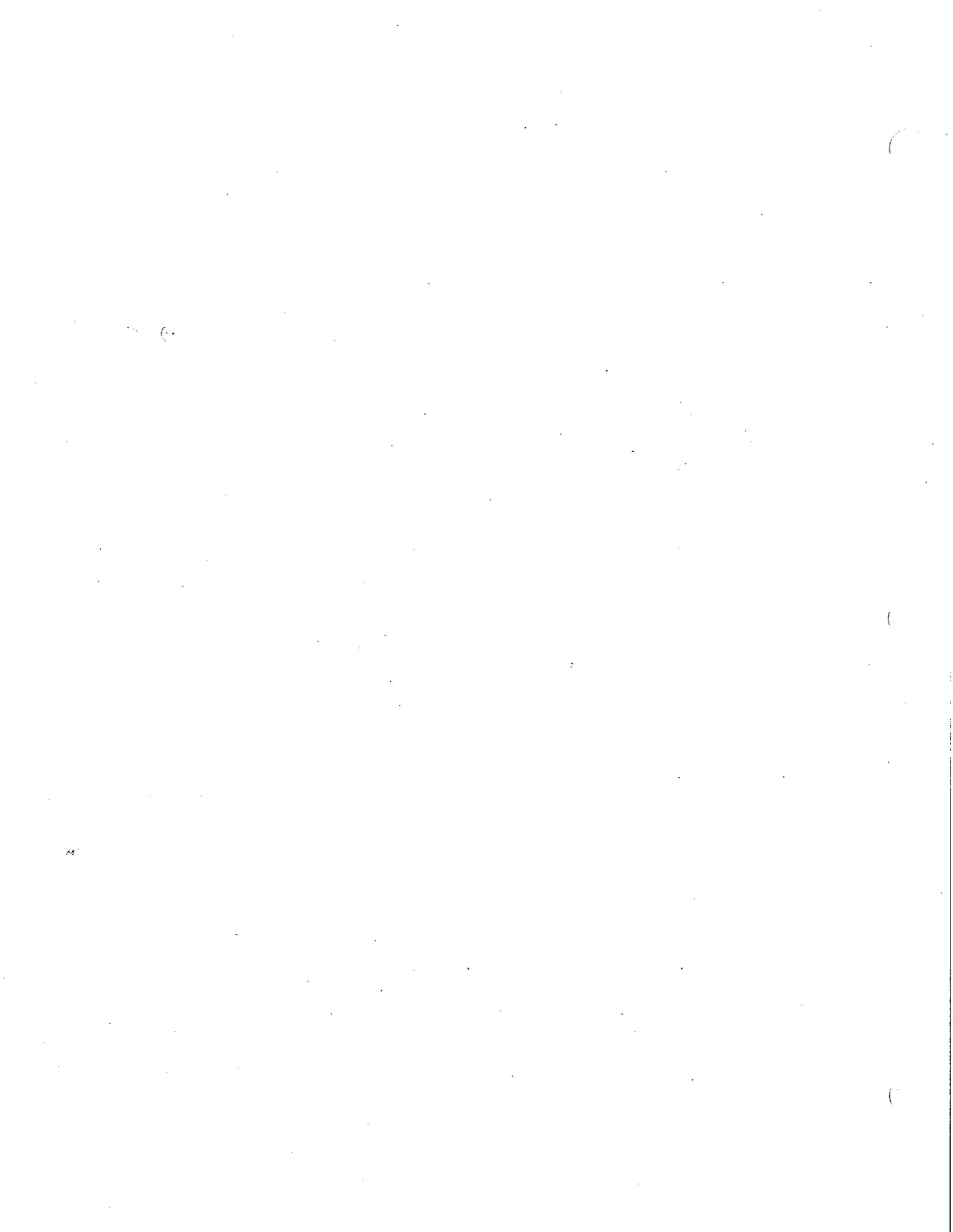
Owner/Operator
David A. Brockman, Manager
U.S. Department of Energy
Richland Operations Office

9/30/09
Date



Co-Operator
John G. Lehew III
President and
Chief Executive Officer
CH2M HILL Plateau Remediation Company

9/2/09
Date



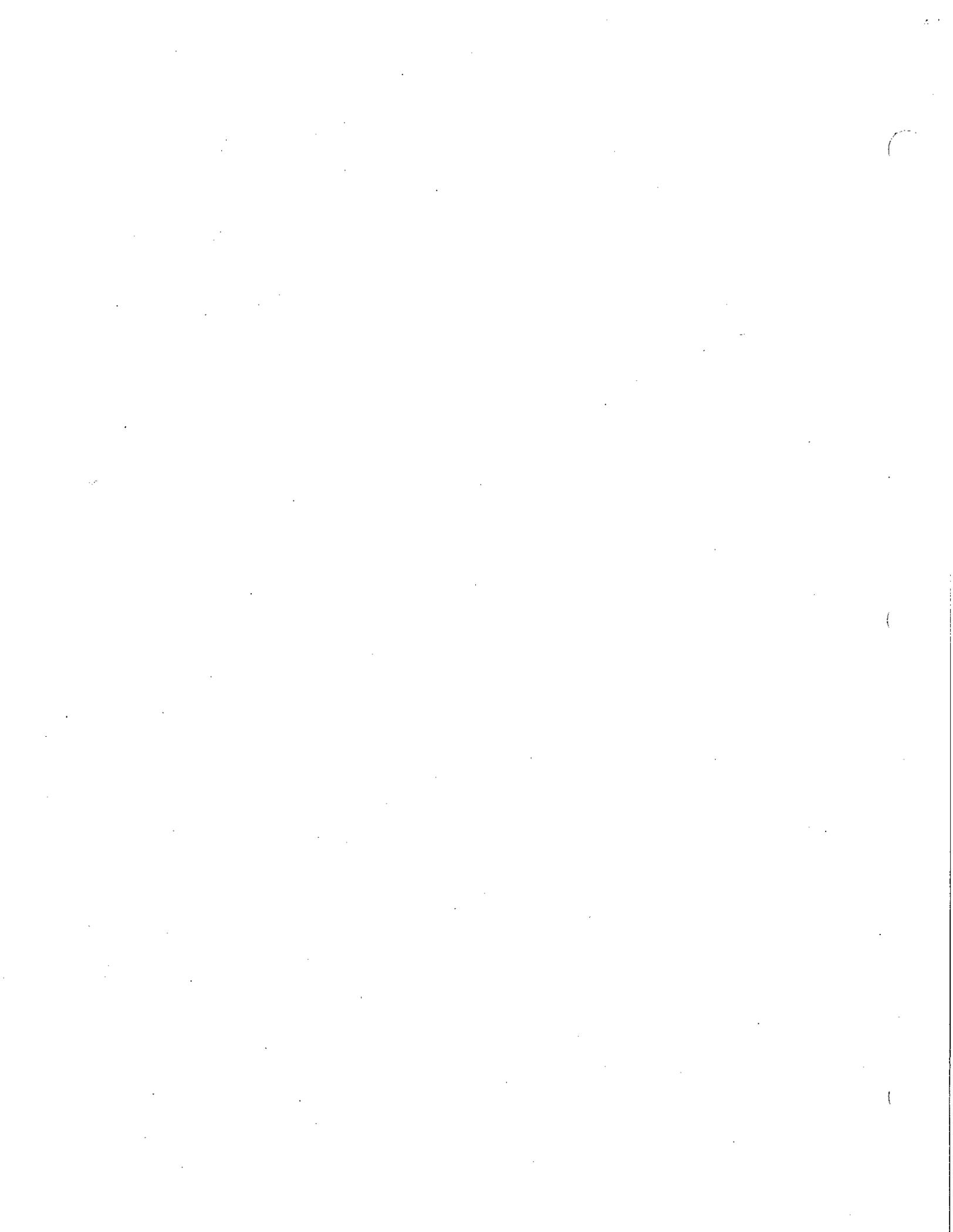
PROFESSIONAL ENGINEER'S CERTIFICATION FOR
THE RCRA CLOSURE OF THE 1706-KE
WASTE TREATMENT SYSTEM

I, the undersigned, an independent registered Professional Engineer, hereby certify that, to the best of my knowledge, all 1706-KE Waste Treatment System closure activities were performed as specified in the *Hanford Facility Dangerous Waste Closure/Postclosure Plan for the 1706-KE Waste Treatment System* (Hanford Dangerous Waste Permit Application, Part A Form, WA7 89000 8967, Part V. Closure Unit 16, Revision 7 dated October 1, 2008.). This certification is based on review of the *Hanford Facility Dangerous Waste Closure/Postclosure Plan for the 1706-KE Waste Treatment System* and facility walk downs described in the attached Specifications and Limitations of Professional Engineer's Certification.

Phillip C. Ohl 9/3/09
Phillip C. Ohl, PE
Washington State PE License No. 35045
Vista Engineering Technologies, LLC
Richland, Washington 99352



EXPIRES: 3/29/10



1706-KE Waste Treatment System, Rev. 0

**SPECIFICATIONS AND LIMITATIONS OF
PROFESSIONAL ENGINEER'S CERTIFICATION FOR
THE RCRA CLOSURE OF THE 1706-KE
WASTE TREATMENT SYSTEM**

September 3, 2009

BACKGROUND

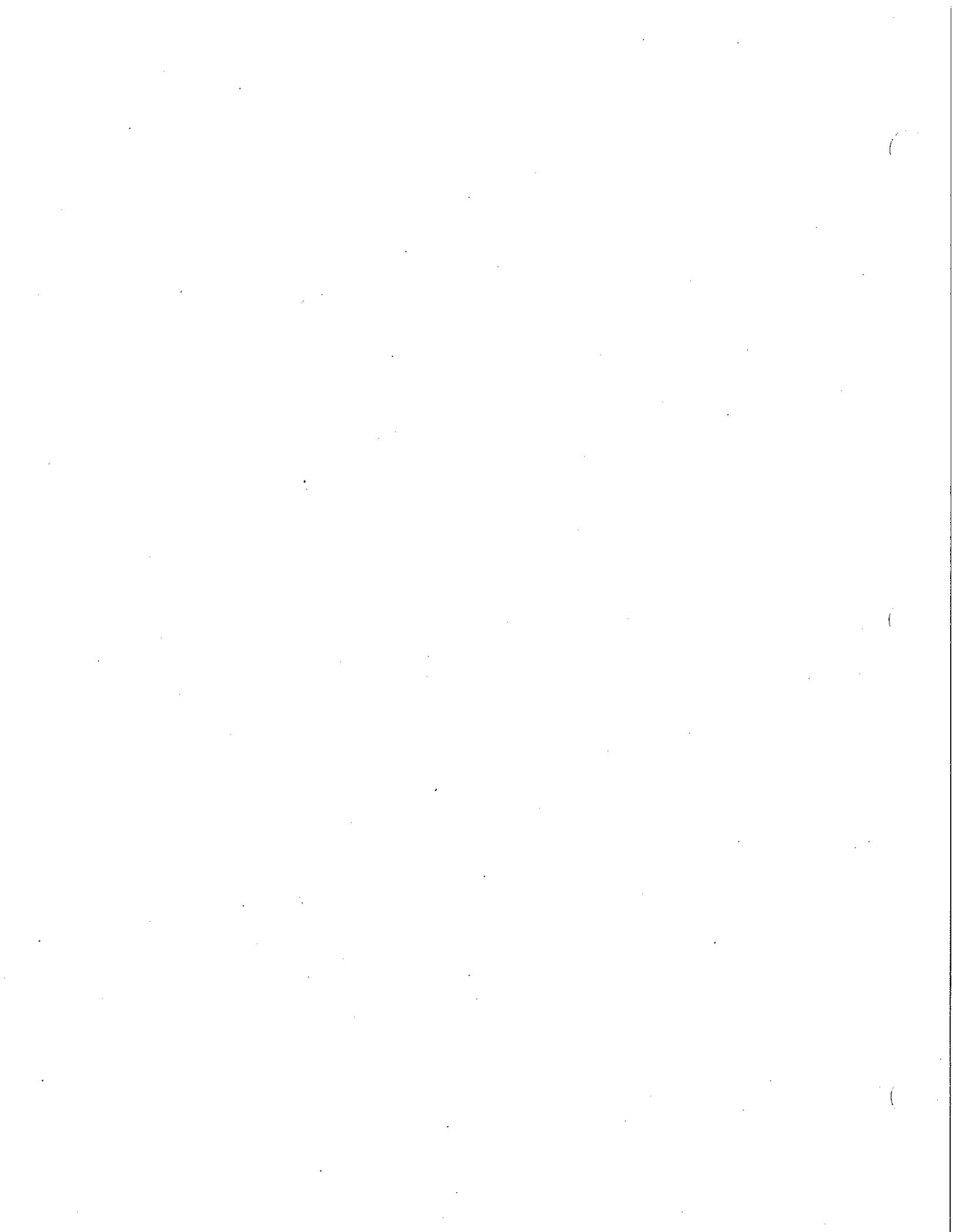
The 1706-KE Waste Treatment System is a *Resource Conservation and Recovery Act of 1976* (RCRA) treatment, storage, and/or disposal (TSD) unit consisting of an ion exchange column, a waste accumulation tank, and evaporator unit, and a condensate collection tank. The system is located in the 1706-KE Building in the 100-K area of the Hanford Site.

In August of 1986, epoxy resin in the evaporator unit overheated causing epoxy to be ejected from the observation port onto the floor, ceiling, adjacent walls, and other components. The room and the equipment were decontaminated for continued use.

The 1706-KE Waste Treatment System (WTS) was designed and installed to treat mixed waste generated in the laboratories of the 1706-KE building. Operation of the 1706-KE WTS was discontinued shortly after the initial startup (1986) because of unexpected anomalies in its operation. In August 1986 epoxy resin in the evaporator unit overheated. Thick white vapor was observed and epoxy was ejected through the observation port onto the ceiling and adjoining wall. The system was immediately shut down and the epoxy cooled and solidified. Decontamination was performed and the waste was removed and properly disposed. There was no evidence of release outside the radiation-posted area or into the environment. The 1706-KE WTS has not operated since 1987.

No listed wastes were ever managed in the unit and the only characteristic potentially exhibited by the waste was corrosivity (D002). All bulk wastes have been long ago removed from the unit. The equipment has now been removed and all that is remaining is the concrete floor.

This closure certification is based on review of relevant documentation and photographs, two physical walk downs of the facility, and a review of photographs after removal of ancillary equipment and debris.



1706-KE Waste Treatment System, Rev. 0

CLOSURE REQUIREMENTS AND PERFORMANCE STANDARDS

Clean Closure of the 1706-KE Waste Treatment System components is to be accomplished by removal and disposal of the components and ancillary equipment. To clean close, all components will be managed as waste.

Clean Closure of the 1706-KE structural components will be accomplished by the Clean Debris Surface performance standard in accordance with WAC-173-303-140 (2)(a). Certification establishes that the floor is clean and meets ERDF waste acceptance criteria.

DOCUMENTATION REVIEWED

Documentation reviewed for this certification activity included:

- Hanford Facility Dangerous Waste Closure/Postclosure Plan for the 1706-KE Waste Treatment System, DOE/RL-2009-29, Revision 2, dated September 3, 2009
- 1706-KE Waste Treatment System Hanford Dangerous Waste Permit Application, Part A Form, Revision 7, dated October 1, 2008
- Photographs taken prior, during, and after closure activities
- Schematic prepared by KE technical staff identifying locations and dimensions of cracks in the concrete floor
- Waste shipping and disposal documentation, establishing that the tanks have been shipped and disposed of at ERDF.
- E-mail dated 8/31/09 from Darrell Rife attesting to removal of ancillary equipment and debris after tank removal

Two physical walk downs of the facility were performed by the IQRPE:

- March 9, 2009 prior to initiation of closure activities
- July 7, 2009 after removal of Waste Treatment System components

CERTIFICATION

The physical walk down of the facility on July 7, 2009 verified that 1706-KE Waste Treatment System components had been removed from the facility. Photographic evidence taken by facility operators on July 7, 2009 and July 8, 2009 was reviewed to verify that the ancillary equipment had subsequently been removed and the structural components (concrete floor) had been cleaned to a Clean Debris Surface performance standard.



1706-KE Waste Treatment System, Rev. 0

This certification was conducted in accordance with WAC 173-303-610 to independently certify that the 1706-KE Waste Treatment System meets closure performance standards in accordance with the approved closure plan.

LIMITATIONS

This certification is strictly limited to the 1706-KE Waste Treatment System as identified in the referenced closure documents. It does not address the 1706-KE Facility or any components or ancillary equipment not associated with the 1706-KE Waste Treatment System. This certification only addressed removal of the 1706-KE Waste Treatment System components and ancillary equipment. Disposal records for removed components were reviewed. Disposal records for removed ancillary equipment and debris were not reviewed. Final disposition of removed ancillary equipment and debris was verified via project manager attestation.

REFERENCES

Facility Dangerous Waste Closure/Postclosure Plan for the 1706-KE Waste Treatment System, DOE/RL-2009-29, Revision 2, dated September 3, 2009

1706-KE Waste Treatment System Hanford Dangerous Waste Permit Application, Part A Form, Revision 7, dated October 1, 2008

40 CFR 268.45, "Land Disposal Restrictions – Treatment standards for hazardous debris," *Code of Federal Regulations*, as amended.

WAC 173-303-610, "Dangerous Waste Regulations – Closure and Post-Closure," *Washington Administrative Code*, as amended.

